Tetra Tech EM Inc.

# HEALTH AND SAFETY PLAN

| | | |
|---|---|---|
| **Site Name:** Y Not Used Tires | **Site Contact:** Michelle Cullerton | **Telephone:** 312 946-6442 |
| **Location:** 1140 Harrison Ave, Rockford, IL | **Client Contact:** Samuel Borries | **Telephone:** 312 353-2886 |
| **EPA I.D. No.** | **Prepared By:** Jodi McCarty | **Date:** 04/16/02 |
| **Project No.** G9009.L.0203017 | **Date of Proposed Activities:** April 29 and 30, 2002 | |

**Objectives:**

The objective of the field sampling effort is to characterize the soil and the materials in the drums at the site and identify areas that may pose a threat to human health and the environment.

**Site Type:** *Check as many as applicable.*

| | | |
|---|---|---|
| ☐ Active | ☐ Confined space | ☐ Well field |
| ☒ Inactive | ☐ Landfill | ☐ Unknown |
| ☐ Secure | ☐ Uncontrolled | ☐ Underground storage tank |
| ☒ Unsecure | ☐ Industrial | ☐ Other *(specify)* |

**Site Description and History:**

Limited information is known about the site history and description at this time. IEPA and U.S. EPA conducted an inventory at the site and noted approximately 24 55-gallon steel and poly drums labeled as containing methylene chloride, polymeric diphenylmethane diisocyanate (MDI), machine cleaner, corrosives, methyl ethyl ketone (MEK), and or oil. Approximately 30 15-gallon carboys containing some type of acid, possibly hydrochloric acid. There are approximately 10 5-gallon containers containing MEIBK and approximately 12 5- to 30-gallon fiber drums containing copper pyro phosphate and other unknown materials. The drums and containers appear to be in deteriorating condition and are stacked unsafely on top each another. Batteries are also observed on the surrounding property.

Note: A site map is provided on Page 9 of 12. Definitions and additional information about this form are provided on Page 12 of 12.



4-28-02

**Waste Management Practices:**

Methylene chloride
MDI
machine cleaner
corrosives
MEK
Oil
Acids
MEIBK
Copper pyro phosphate

*Waste management practices are not known at this time.

**Waste Types:** [X] Liquid [X] Solid [X] Sludge [ ] Gas [ ] Unknown

**Waste Characteristics:**

[X] Corrosive
[X] Toxic
[ ] Inert
[X] Ignitable
[X] Flammable
[ ] Volatile
[X] Reactive
[ ] Radioactive
[ ] Unknown
[ ] Other *(specify)* _____

**Hazards of Concern:**

[X] Heat stress
[ ] Cold stress
[X] Explosion or fire hazard
[ ] Oxygen deficiency
[ ] Radiological hazard
[ ] Underground storage tanks
[ ] Surface tanks
[ ] Buried utilities
[ ] Overhead utilities
[X] Biological hazard
[ ] Noise
[X] Inorganic chemicals
[X] Organic chemicals
[X] Heavy equipment
[X] Other *(specify)* Deteriorated containers stacked on top of each other

**Explosion or Fire Potential:** [ ] High [ ] Medium [ ] Low [X] Unknown

# HEALTH AND SAFETY PLAN

**Chemical Products Tetra Tech EM Inc. Will Use or Store On Site:** (Attach a Material Safety Data Sheet [MSDS] for each item.)

- [X] Alconox® or Liquinox®
- [X] Hydrochloric acid (HCl)
- [X] Nitric acid ($HNO_3$)
- [ ] Sodium hydroxide (NaOH)
- [ ] Sulfuric acid ($H_2SO_4$)
- [ ] Other *(specify)* _____
- [ ] Other *(specify)* _____
- [ ] Other *(specify)* _____
- [ ] Other *(specify)* _____
- [ ] Other *(specify)* _____
- [ ] Other *(specify)* _____
- [ ] Other *(specify)* _____

| Chemicals Present at Site | Highest Observed Concentration (specify units and media) | PEL/TLV (specify ppm or mg/m$^3$) | IDLH Level (specify ppm or mg/m$^3$) | Symptoms and Effects of Acute Exposure | Photo-ionization Potential (eV) |
|---|---|---|---|---|---|
| Methylene chloride | U | 25 ppm | 2,300 ppm | Irritation to the eyes and skin; fatigue, weakness, and light-headed; nausea; numb, tingling limbs | 11.32 |
| Polymeric diphenylmethane diisocyanate (MDI) | U | 0.05 mg/m$^3$ | 75 mg/m$^3$ | Irritation to the eyes, nose, and throat; chest pain, coughing, pulmonary secretions; asthma | NE |
| Corrosives | U | 1 mg/m$^3$ | 15 mg/m$^3$ | Irritation to the eyes, skin, nose, and throat; pulmonary edema, bronchitis; stomatis; dental erosion; burns to the eyes and skin | NE |
| MEK | U | 0.2 ppm | NE | Irritation to the eyes, skin, nose and throat; cough and pulmonary edema; blurred vision; blisters and scars on the skin; abdominal pain, vomiting, diarrhea | NE |
| Hydrochloric acid | U | 5 ppm | 50 ppm | Irritation to the nose, throat, and larynx; coughing and choking, dermatitis; eye and skin burns | 12.74 |
| Methyl isobutyl ketone (MeIBK) | U | 50 ppm | 500 ppm | Gastrointestinal disturbances; headache, nausea, and respiratory tract irritation; blurred vision | NE |
| Copper pyro phosphate | U | 1 mg/m$^3$ | 100 mg/m$^3$ | Irritation to the eyes, nose, and pharynx; metallic taste in mouth; dermatitis; nasal perferations | NE |
| Lead | U | 0.05 mg/m$^3$ | 100 mg/m$^3$ | Weakness and insomnia; facial pallor; anorexia and low-weight; malnutrition; constipation, abdominal pain, and cholic; anemia; tremors; paralysis in the ankles and wrist, kidney disease; irritation to the eyes; hypotension | NE |

**Notes:** The "NIOSH Pocket Guide to Chemical Hazards" 1997.

A = Air
CARC = Carcinogenic
eV = Electron volt
GW = Groundwater
IDLH = Immediately dangerous to life or health
mg/m$^3$ = Milligram per cubic meter
NA = Not available
NE = None established
PEL = Permissible exposure limit
ppm = Part per million
S = Soil
SW = Surface water
TLV = Threshold limit value
U = Unknown

Tetra Tech EM Inc.

# HEALTH AND SAFETY PLAN

**Field Activities Covered Under This Plan:**

| Task Description | Type | Level of Protection | | Date of Activities |
|---|---|---|---|---|
| | | Primary | Contingency | |
| 1 Site Walkthrough | ☐ Intrusive<br>☒ Nonintrusive | ☐ C ☒ D<br>☐ Modified | ☐ C ☐ D<br>☐ Modified | April 29, 2002 |
| 2 Drum and container sampling | ☒ Intrusive<br>☐ Nonintrusive | ☒ B ☐ D<br>☐ Modified | ☐ C ☒ D<br>☒ Modified | April 29, 2002 |

**Site Personnel and Responsibilities (include subcontractors):**

| Employee Name and Office Code | Task | Responsibilities |
|---|---|---|
| Michelle Cullerton/CH | 1,2 | Project Manager or Field Team Leader: Directs project investigation activities, makes site safety coordinator (SSC) aware of pertinent project developments and plans, and maintains communications with client as necessary. |
| Michelle Cullerton/CH | 1,2 | Site Safety Coordinator (SSC): Ensures that appropriate personal protective equipment (PPE) is available, enforces proper utilization of PPE by on-site personnel, suspends investigative work if he or she believes that site personnel are or may be exposed to an immediate health hazard, implements the health and safety plan, and reports any observed deviations from anticipated conditions described in the health and safety plan to the health and safety representative. |
| Michelle Cullerton/CH<br>Brandt Brown/CH<br>Brad White/CH<br>Jodi McCarty/CH | 1,2 | Field Personnel: Complete tasks as directed by the project manager, field team leader, and SSC and follow all procedures and guidelines established in the Tetra Tech, Inc., Health and Safety Manual. |

Tetra Tech EM Inc.

# HEALTH AND SAFETY PLAN

**Protective Equipment:** (Indicate type or material as necessary for each task; attach additional sheets as necessary)

| Task 1 | Task 2 |
|---|---|
| Task: [X] 1 [ ] 2 | Task: [ ] 1 [X] 2 |
| Level: [ ] C [X] D [ ] Modified | Level: [X] B [ ] D [ ] Modified |
| [X] Primary [ ] Contingency | [X] Primary [ ] Contingency |
| **RESPIRATORY** | **RESPIRATORY** |
| [ ] Not needed | [ ] Not needed |
| [ ] APR: _____ | [ ] APR: _____ |
| [ ] Cartridge: _____ | [ ] Cartridge: _____ |
| [ ] Escape mask: _____ | [ ] Escape mask: _____ |
| [ ] Other: SCBA | [X] Other: SCBA |
| **PROTECTIVE CLOTHING** | **PROTECTIVE CLOTHING** |
| [ ] Not needed | [ ] Not needed |
| [ ] Tyvek® coveralls: _____ | [X] Tyvek® coveralls: _____ |
| [ ] Saranex® coveralls: _____ | [X] Saranex® coveralls: _____ |
| [ ] Coveralls: _____ | [ ] Coveralls: _____ |
| [ ] Other: _____ | [ ] Other: _____ |
| **HEAD AND EYE** | **HEAD AND EYE** |
| [ ] Not needed | [ ] Not needed |
| [X] Safety glasses: _____ | [ ] Safety glasses: _____ |
| [ ] Face shield: _____ | [ ] Face shield: _____ |
| [ ] Goggles: _____ | [ ] Goggles: _____ |
| [X] Hard hat: _____ | [X] Hard hat: _____ |
| [ ] Other: _____ | [ ] Other: _____ |
| **GLOVES** | **GLOVES** |
| [ ] Not needed | [ ] Not needed |
| [X] Undergloves: Latex | [X] Undergloves: Latex |
| [ ] Gloves: Nitrile | [X] Gloves: Nitrile |
| [ ] Overgloves: Neoprene | [X] Overgloves: Neoprene |
| **FIRST AID EQUIPMENT** | **FIRST AID EQUIPMENT** |
| [ ] Not needed | [ ] Not needed |
| [X] Standard First Aid kit | [X] Standard First Aid kit |
| [ ] Portable eyewash | [ ] Portable eyewash |
| **BOOTS** | **BOOTS** |
| [ ] Not needed | [ ] Not needed |
| [X] Work boots: Steel-Toe/Steel Shank | [X] Work boots: Steel-Toe/Steel Shank |
| [ ] Overboots: _____ | [X] Overboots: Rubber booties |
| OTHER *(specify)* _____ | OTHER *(specify)* _____ |

**Note:** APR = Air purifying respirator SCBA = Self-contained breathing apparatus

# HEALTH AND SAFETY PLAN

**Monitoring Equipment:** (Specify instruments needed for each task; attach additional sheets as necessary)

| Instrument | Task | Instrument Reading | Action Guideline | Comments |
|---|---|---|---|---|
| Combustible gas indicator model: | [X] 1<br>[X] 2 | 0 to 10% LEL | No explosion hazard | [ ] Not needed |
| | | 10 to 25% LEL | Potential explosion hazard; notify SSC | |
| | | >25% LEL | Explosion hazard; interrupt task; evacuate site; notify SSC | |
| $O_2$ meter model: [ ] | [X] 1<br>[X] 2 | >23.5% $O_2$ | Potential fire hazard; evacuate site | [ ] Not needed |
| | | 23.5 to 19.5% $O_2$ | Oxygen level normal | |
| | | <19.5% $O_2$ | Oxygen deficiency; interrupt task; evacuate site; notify SSC | |
| Radiation survey meter model: | [X] 1<br>[ ] 2 | <2 mrem per hour | Normal background | Note: Annual exposure not to exceed 1,250 mrem per quarter [ ] Not needed |
| | | Three times background | Notify SSC | |
| | | >2 mrem per hour | Radiological hazard; interrupt task; evacuate site; notify SSC | |
| Photoionization detector model:<br>[X] 11.7 eV<br>[ ] 10.2 eV<br>[ ] 9.8 eV<br>[ ] _____ eV | [X] 1<br>[X] 2 | >0 to 5 ppm above background | Level D | [ ] Not needed |
| | | >5 to 20 ppm above background | Level C | |
| | | >20 ppm above background | Evacuate site; notify SSC | |
| Flame ionization detector model: | [ ] 1<br>[ ] 2 | >0 to 5 ppm above background | Level D | [X] Not needed |
| | | >5 to 20 ppm above background | Level C | |
| | | >20 ppm above background | Evacuate site; notify SSC | |
| Detector tube models: | [ ] 1<br>[ ] 2 | Specify: | Specify: | Note: The action level for upgrading the level of protection is one-half of the contaminant's PEL. If the PEL is reached, evacuate the site and notify the SSC. [X] Not needed |
| Respirable dust monitor model: | [ ] 1<br>[ ] 2 | Specify: | Specify: | [X] Not needed |
| Other: (specify) | [ ] 1<br>[ ] 2 | Specify: | Specify: | [X] Not needed |

Notes: eV = Electron volt LEL = Lower explosive limit mrem = Millirem $O_2$ = Oxygen PEL = Permissible exposure limit ppm = Part per million

# HEALTH AND SAFETY PLAN

| Additional Comments: | Emergency Contacts: | Telephone |
|---|---|---|
| | U.S. Coast Guard National Response Center | 800/424-8802 |
| | InfoTrac | 800/535-5053 |
| | Fire department | 911 or 815/987-5660 |
| | Police department | 911 or 815/987-5912 |
| | Tetra Tech EM Inc. Personnel: | |
| | Human Resource Development: Norman Endlich | 703/390-0626 |
| | Health & Safety Representative: Judith Wagner | 847/818-7192 |
| | Office Health and Safety Coordinator: Jodi McCarty | 312/946-6482 |
| | Project Manager: Michelle Cullerton | 312/946-6442 |
| | Site Safety Coordinator: Michelle Cullerton | 312/946-6442 |

**Personnel Decontamination and Disposal Method:**

Personnel will follow the U.S. Environmental Protection Agency's "Standard Operating Safety Guides" for decontamination procedures for modified Level D personal protection (with modified Level C contingency). The following decontamination stations should be set up in each decontamination zone:

- Segregated equipment drop
- Boot and glove wash and rinse
- Disposable glove, bootie, and coverall removal and segregation station
- Safety glasses and hard hat removal station
- Hand and face wash and rinse

If site conditions require upgrade to Level C, a station must be set up for respirator removal, respirator decontamination, and cartridge disposal.

All disposable equipment, clothing, and wash water will be double-bagged or containerized in an acceptable manner and disposed of in accordance with local regulations.

**Medical Emergency:**

Hospital Name: Swedish American Hospital

Hospital Address: 1825 Cumberland Street
Rockford, IL

Hospital Telephone: Emergency - 911
General - 815/963-2821

Ambulance Telephone: 911 or 815/877-4177

Route to Hospital: (see Page 10 of 12 for route map)

Start on IL-251. Turn left onto highway. Continue on 9th Street. Bear left onto North 9th Street. Turn right onto North Longwood Street. Bear right on IL-251. Bear right on Spring Creek Road. Continue on Auburn Street. Turn right onto Cumberland Street.

**Note:** This page must be posted on site.

YAHOO! Maps

Yahoo! - Yellow Pages -

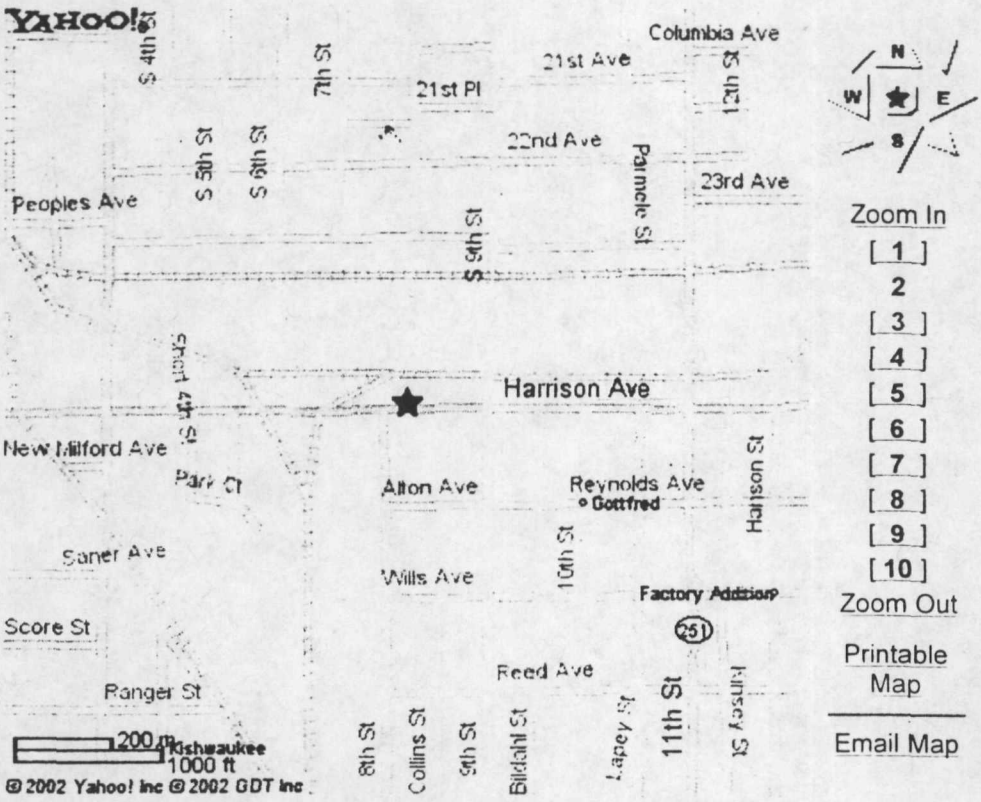
**Welcome, Guest User**

Create My Locations - Sig

## Yahoo! Maps

★ **1140 Harrison Ave, Rockford, IL 61104-**

Save This Add




### Driving Directions

- To this location
- From this location

### Map New Location

-- My Locations -- Sign In

Address, Intersection or Airport Code

1140 Harrison Ave

City, State or Zip

Rockford, IL 61104-726

United States

Get Map

Add Maps to My Yahoo!

### Weather

weather.com

- Interstate Forecast
- Road Conditions
- Airport & Travel Info

### Find Nearby Services

Nearby Businesses

- Car Rentals
- Gas Stations
- Hotels and Motels
- Restaurants

City Guide

Yahoo! Travel

Yahoo! Weather

**Business Locator** - Click on business name to view the locations on map

State Farm Insurance

**Welcome, Guest User**

Create My Locations - Sig

## Yahoo! Yellow Pages

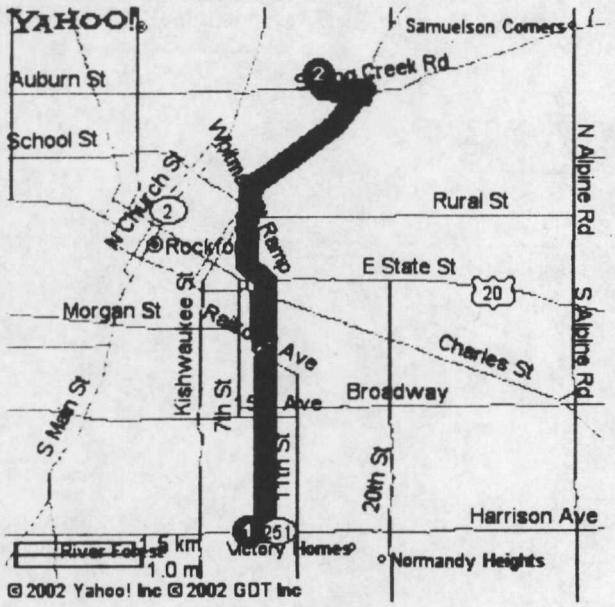
**Starting from:** 1140 Harrison Ave, Rockford, IL 61104-7262

**Arriving at:** Swedish American Hospital
1825 Cumberland St, Rockford, IL 61103-4761

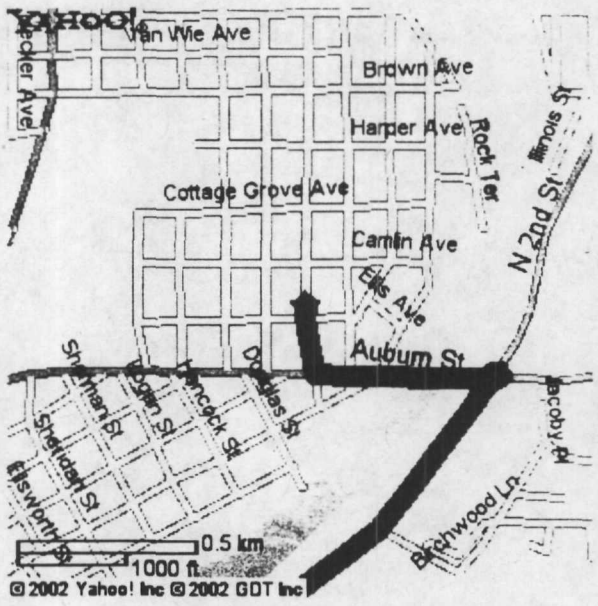
(815) 963-2821

**Distance:** 4.6 miles **Approximate Travel Time:** 10 mins

- Email Directions
- Get Reverse Directions
- Text Only Driving Directio




Full Route




Destination

| | Directions | Miles |
|---|---|---|
| 1. | Start on **IL-251** | 0.1 |
| 2. | Turn Left on the highway | 0.2 |
| 3. | Continue on **9TH ST** | 0.7 |
| 4. | Continue on the highway | 0.2 |
| 5. | Continue on **9TH ST** | 0.3 |
| 6. | Continue on the highway | 0.6 |
| 7. | Bear Left on **N 9TH ST** | 0.2 |
| 8. | Turn Right on **N LONGWOOD ST** | 0.6 |

| | | |
|---|---|---|
| 9. | Bear Right on **IL-251** | 1.2 |
| 10. | Turn Right on the highway | 0.0 |
| 11. | Bear Right on **SPRING CREEK RD** | 0.1 |
| 12. | Continue on **AUBURN ST** | 0.2 |
| 13. | Turn Right on **CUMBERLAND ST** | 0.1 |

**When using any driving directions or map, it's a good idea to do a reality check and make sure the road s exists, watch out for construction, and follow all traffic safety precautions. This is only to be used as an a in planning.**

**Driving Directions** New Locati

**1 Enter a starting address** or select from My Locations

**My Locations** -- My Locations -- Sign In

**Address** ( Address, Intersection or Airport Code ) 1140 Harrison Ave

**City, State or Zip** Rockford, IL 61104-7262

**Country** United States

**2 Enter a destination address** or select from My Locations

**My Locations** -- My Locations -- Sign In

**Address** ( Address, Intersection or Airport Code ) 1825 Cumberland St

**City, State or Zip** Rockford, IL 61103-4761

**Country** United States

Get Directions

## APPROVAL AND SIGN-OFF FORM

### Project No. *G9009.L.0203017*

*I have read, understood, and agree with the information set forth in this Health and Safety Plan and will follow the direction of the Site Safety Coordinator as well as procedures and guidelines established in the Tetra Tech, Inc., Health and Safety Manual. I understand the training and medical requirements for conducting field work and have met these requirements.*

| Name | Signature | Date |
|---|---|---|
| Greg Kazmarski | Greg Kazmarski | 4-29-02 |
| Rebecca Kershaw | Rebecca Kershaw | 4/29/02 |
| Shawn Newell | Shawn Newell | 4/29/02 |
| Brandt Brown | Brandt Brown | 4/29/02 |
| Jodi McCarthy | Jodi McCarthy | 4.29.02 |

**APPROVALS:** *(Two Signatures Required)*

| | | |
|---|---|---|
| Michelle Cutlip | Michelle Cutlip | 4/29/02 |
| Sam Borries | Sam Borries | 4/29/02 |
| Brad White | Brad White | 4/29/02 |

Site Safety Coordinator

| | |
|---|---|
| | |

Health and Safety Representative or Designee — Date

## DEFINITIONS

**Intrusive** - Work involving excavation to any depth, drilling, opening of monitoring wells, most sampling, and Geoprobe® work

**Nonintrusive** - Generally refers to site walk-throughs or field reconnaissance

**Levels of Protection**

**Modified Level D** - Hard hat, safety boots, and glasses

**Level D** - Items listed for modified Level D above, **PLUS** protective clothing such as gloves, boot covers, and Tyvek® or Saranex® coveralls

**Modified Level C** - Hard hat, safety boots, glasses, and air purifying respirators with appropriate cartridges

**Level C** - Items listed for modified Level C above, **PLUS** protective clothing such as gloves, boot covers, and Tyvek® or Saranex® coveralls

**Emergency Contacts**

**InfoTrac** - For issues related to incidents involving the transportation of hazardous chemicals; this hotline provides accident assistance 24 hours per day, 7 days per week

**U.S. Coast Guard National Response Center** - For issues related to spill containment, cleanup, and damage assessment; this hotline will direct spill information to the appropriate state or region

**Health and Safety Plan Short Form**

- Used for field projects of limited duration and with relatively limited activities; may be filled in with handwritten text
- Limitations:
  - No Level B or A work
  - No more than two tasks
  - No confined space entry
  - No unexploded ordnance work

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### Project No. *G9009.L.0203017*

*I have read, understood, and agree with the information set forth in this Health and Safety Plan and will follow the direction of the Site Safety Coordinator as well as procedures and guidelines established in the Tetra Tech, Inc., Health and Safety Manual. I understand the training and medical requirements for conducting field work and have met these requirements.*

| Name | Signature | Date |
|---|---|---|
| | | |
| | | |
| | | |
| | | |

**APPROVALS:** *(Two Signatures Required)*

| | |
|---|---|
| Site Safety Coordinator | Date |
| Health and Safety Representative or Designee | Date |

# HEALTH AND SAFETY PLAN

## DEFINITIONS

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  - — No unexploded ordnance work

**MSDS** Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

J.T.Baker

24 Hour Emergency Telephone 908-859-2151
CHEMTREC 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1 800 582 2537) for assistance.

# ALCONOX(R)

**MSDS Number: A2052 --- *Effective Date: 02/21/00***

## 1. Product Identification

**Synonyms:** Proprietary blend of sodium linear alkylaryl sulfonate, alcohol sulfate, phosphates, and carbonates.
**CAS No.:** Not applicable.
**Molecular Weight:** Not applicable to mixtures.
**Chemical Formula:** Not applicable to mixtures.
**Product Codes:** A461

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Alconox(R)<br>proprietary detergent mixture | N/A | 90 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT.**

**J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)**

---

Health Rating: 1 - Slight
Flammability Rating: 0 - None
Reactivity Rating: 1 - Slight
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT
Storage Color Code: Orange (General Storage)

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**Potential Health Effects**

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**Inhalation:**
May cause irritation to the respiratory tract. Symptoms may include coughing and shortness of breath.
**Ingestion:**
May cause irritation to the gastrointestinal tract. Symptoms may include nausea, vomiting and diarrhea.
**Skin Contact:**
No adverse effects expected.
**Eye Contact:**
May cause irritation, redness and pain.
**Chronic Exposure:**
No information found.
**Aggravation of Pre-existing Conditions:**
No information found.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. Get medical attention for any breathing difficulty.
**Ingestion:**
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention.
**Skin Contact:**
Wash exposed area with soap and water. Get medical advice if irritation develops.
**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

---

# 5. Fire Fighting Measures

**Fire:**
Not expected to be a fire hazard.
**Explosion:**

No information found.

**Fire Extinguishing Media:**

Dry chemical, foam, water or carbon dioxide.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

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## 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Spills: Pick up and place in a suitable container for reclamation or disposal, using a method that does not generate dust. When mixed with water, material foams profusely. Small amounts of residue may be flushed to sewer with plenty of water.

---

## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Moisture may cause material to cake. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product.

---

## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**

- OSHA Permissible Exposure Limit (PEL):

15 mg/m3 total dust, 5 mg/m3 respirable fraction for nuisance dusts.

- ACGIH Threshold Limit Value (TLV):

10 mg/m3 total dust containing no asbestos and < 1% crystalline silica for Particulates Not Otherwise Classified (PNOC).

**Ventilation System:**

A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

**Personal Respirators (NIOSH Approved):**

If the exposure limit is exceeded, a half-face dust/mist respirator may be worn for up to ten times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. A full-face piece dust/mist respirator may be worn up to 50 times the exposure limit, or the maximum use concentration specified by the appropriate regulatory agency, or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known,

use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air-purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear protective gloves and clean body-covering clothing.
**Eye Protection:**
Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
White powder interspersed with cream colored flakes.
**Odor:**
No information found.
**Solubility:**
Moderate (1-10%)
**Specific Gravity:**
No information found.
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
0
**Boiling Point:**
No information found.
**Melting Point:**
No information found.
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
No information found.
**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Carbon dioxide and carbon monoxide may form when heated to decomposition.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
No information found.
**Conditions to Avoid:**
No information found.

# 11. Toxicological Information

No LD50/LC50 information found relating to normal routes of occupational exposure.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Alconox(R) proprietary detergent mixture | No | No | None |

# 12. Ecological Information

**Environmental Fate:**
This product is biodegradable.
**Environmental Toxicity:**
No information found.

# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste disposal facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

# 14. Transport Information

Not regulated.

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\----------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Alconox(R) proprietary detergent mixture | Yes | No | No | No |

--------\Chemical Inventory Status - Part 2\----------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Alconox(R) | No | No | Yes | No |
| proprietary detergent mixture | | | | |

\Federal, State & International Regulations - Part 1\

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Alconox(R) | No | No | No | No |
| proprietary detergent mixture | | | | |

\Federal, State & International Regulations - Part 2\

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Alconox(R) | No | No | No |
| proprietary detergent mixture | | | |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: No Fire: No Pressure: No
Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** No information found.
**Poison Schedule:** No information found.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **0** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
CAUTION! MAY BE HARMFUL IF SWALLOWED OR INHALED. MAY CAUSE IRRITATION TO EYES AND RESPIRATORY TRACT.
**Label Precautions:**
Avoid contact with eyes.
Keep container closed.
Use with adequate ventilation.
Avoid breathing dust.
Wash thoroughly after handling.
**Label First Aid:**
If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In case of eye contact, immediately flush eyes with plenty of water for at least 15 minutes. In all cases, get medical attention.
**Product Use:**

Laboratory Reagent.

**Revision Information:**

MSDS Section(s) changed since last revision of document include: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 15, 16.

**Disclaimer:**

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**********

**Prepared by:** Strategic Services Division
Phone Number: (314) 539-1600 (U.S.A.)

MSDS Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1 800-582-2537) for assistance

# HYDROCHLORIC ACID, 33 - 40%

**MSDS Number: H3880 --- *Effective Date: 05/10/01***

## 1. Product Identification

**Synonyms:** Muriatic acid; hydrogen chloride, aqueous
**CAS No.:** 7647-01-0
**Molecular Weight:** 36.46
**Chemical Formula:** HCl
**Product Codes:**
J.T. Baker: 5367, 5537, 5575, 5800, 5814, 5839, 5894, 5994, 6900, 7831, 9529, 9530, 9534, 9535, 9536, 9537, 9538, 9539, 9540, 9544, 9548
Mallinckrodt: 2062, 2612, 2624, 2626, 5587, H611, H613, H987, H992, H999, V078, V628

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Hydrogen Chloride | 7647-01-0 | 33 - 40% | Yes |
| Water | 7732-18-5 | 60 - 67% | No |

## 3. Hazards Identification

**Emergency Overview**

**POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS**

**TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG DAMAGE.**

**J.T. Baker SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

---

Health Rating: 3 - Severe (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 2 - Moderate
Contact Rating: 3 - Severe (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: White (Corrosive)

---

**Potential Health Effects**

---

**Inhalation:**
Corrosive! Inhalation of vapors can cause coughing, choking, inflammation of the nose, throat, and upper respiratory tract, and in severe cases, pulmonary edema, circulatory failure, and death.
**Ingestion:**
Corrosive! Swallowing hydrochloric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract. May cause nausea, vomiting, and diarrhea. Swallowing may be fatal.
**Skin Contact:**
Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and discolor skin.
**Eye Contact:**
Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.
**Chronic Exposure:**
Long-term exposure to concentrated vapors may cause erosion of teeth. Long term exposures seldom occur due to the corrosive properties of the acid.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing skin disorders or eye disease may be more susceptible to the effects of this substance.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
**Ingestion:**
DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.
**Skin Contact:**
In case of contact, immediately flush skin with plenty of water for at least 15 minutes while

removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

---

# 5. Fire Fighting Measures

**Fire:**

Extreme heat or contact with metals can release flammable hydrogen gas.

**Explosion:**

Not considered to be an explosion hazard.

**Fire Extinguishing Media:**

If involved in a fire, use water spray. Neutralize with soda ash or slaked lime.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Structural firefighter's protective clothing is ineffective for fires involving hydrochloric acid. Stay away from ends of tanks. Cool tanks with water spray until well after fire is out.

---

# 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® or TEAM® 'Low Na+' acid neutralizers are recommended for spills of this product.

---

# 7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. When opening metal containers, use non-sparking tools because of

the possibility of hydrogen gas being present. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
-OSHA Permissible Exposure Limit (PEL):
5 ppm Ceiling
-ACGIH Threshold Limit Value (TLV):
5 ppm Ceiling

**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded, a full facepiece respirator with an acid gas cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
Colorless, fuming liquid.
**Odor:**
Pungent odor of hydrogen chloride.
**Solubility:**
Infinite in water with slight evolution of heat.
**Density:**
1.18
**pH:**
For HCL solutions: 0.1 (1.0 N), 1.1 (0.1 N), 2.02 (0.01 N)
**% Volatiles by volume @ 21C (70F):**
100

**Boiling Point:**
53C (127F) Azeotrope (20.2%) boils at 109C (228F)
**Melting Point:**
-74C (-101F)
**Vapor Density (Air=1):**
No information found.
**Vapor Pressure (mm Hg):**
190 @ 25C (77F)
**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage. Containers may burst when heated.
**Hazardous Decomposition Products:**
When heated to decomposition, emits toxic hydrogen chloride fumes and will react with water or steam to produce heat and toxic and corrosive fumes. Thermal oxidative decomposition produces toxic chlorine fumes and explosive hydrogen gas.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
A strong mineral acid, concentrated hydrochloric acid is incompatible with many substances and highly reactive with strong bases, metals, metal oxides, hydroxides, amines, carbonates and other alkaline materials. Incompatible with materials such as cyanides, sulfides, sulfites, and formaldehyde.
**Conditions to Avoid:**
Heat, direct sunlight.

---

# 11. Toxicological Information

Inhalation rat LC50: 3124 ppm/1H; oral rabbit LD50: 900 mg/kg (Hydrochloric acid concentrated); investigated as a tumorigen, mutagen, reproductive effector.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Hydrogen Chloride (7647-01-0) | No | No | 3 |
| Water (7732-18-5) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
When released into the soil, this material is not expected to biodegrade. When released into the soil, this material may leach into groundwater.
**Environmental Toxicity:**
This material is expected to be toxic to aquatic life.

---

# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

# 14. Transport Information

**Domestic (Land, D.O.T.)**
---
**Proper Shipping Name:** HYDROCHLORIC ACID
**Hazard Class:** 8
**UN/NA:** UN1789
Packing Group: II
**Information reported for product/size:** 475LB

**International (Water, I.M.O.)**
---
**Proper Shipping Name:** HYDROCHLORIC ACID
**Hazard Class:** 8
**UN/NA:** UN1789
Packing Group: II
**Information reported for product/size:** 475LB

---

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\--------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Hydrogen Chloride (7647-01-0) | Yes | Yes | Yes | Yes |
| Water (7732-18-5) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\--------

| | | --Canada-- | | |
|---|---|---|---|---|
| Ingredient | Korea | DSL | NDSL | Phil. |
| Hydrogen Chloride (7647-01-0) | Yes | Yes | No | Yes |

| | | | | |
|---|---|---|---|---|
| Water (7732-18-5) | Yes | Yes | No | Yes |

\-------\Federal, State & International Regulations - Part 1\----------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Hydrogen Chloride (7647-01-0) | 5000 | 500* | Yes | No |
| Water (7732-18-5) | No | No | No | No |

\-------\Federal, State & International Regulations - Part 2\----------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Hydrogen Chloride (7647-01-0) | 5000 | No | No |
| Water (7732-18-5) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No
Reactivity: No (Mixture / Liquid)

**Australian Hazchem Code:** 2R
**Poison Schedule:** None allocated.
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **3** Flammability: **0** Reactivity: **0**
**Label Hazard Warning:**
POISON! DANGER! CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG DAMAGE.
**Label Precautions:**
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Use only with adequate ventilation.
Wash thoroughly after handling.
Store in a tightly closed container.
Remove and wash contaminated clothing promptly.
**Label First Aid:**
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.
**Product Use:**

Laboratory Reagent.

**Revision Information:**

MSDS Section(s) changed since last revision of document include: 16.

**Disclaimer:**

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**********

**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

**MSDS** Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone 908-859-2151
CHEMTREC 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1 800 582 2537) for assistance

# NITRIC ACID, 50-70%

**MSDS Number: N3660 --- *Effective Date: 07/13/00***

## 1. Product Identification

**Synonyms:** Aqua Fortis; Azotic Acid; Nitric Acid 50%; Nitric Acid 65%; nitric acid 69-70%
**CAS No.:** 7697-37-2
**Molecular Weight:** 63.01
**Chemical Formula:** HNO3
**Product Codes:** J.T. Baker: 411D, 412D, 5371, 5555, 5801, 5826, 5876, 5896, 9597, 9598, 9600, 9601, 9602, 9603, 9604, 9606, 9607, 9608, 9616, 9617
Mallinckrodt: 1409, 2704, 6623, H988, H993, H998, V069, V077, V336, V561, V633, V650

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Nitric Acid | 7697-37-2 | 50 - 70% | Yes |
| Water | 7732-18-5 | 30 - 50% | No |

## 3. Hazards Identification

### Emergency Overview

**POISON! DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE.**

**J.T. Baker SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

---

Health Rating: 3 - Severe (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 3 - Severe (Oxidizer)
Contact Rating: 4 - Extreme (Corrosive)
Lab Protective Equip: GOGGLES & SHIELD; LAB COAT & APRON; VENT HOOD; PROPER GLOVES
Storage Color Code: Yellow (Reactive)

---

**Potential Health Effects**

---

Nitric acid is extremely hazardous; it is corrosive, reactive, an oxidizer, and a poison.

**Inhalation:**
Corrosive! Inhalation of vapors can cause breathing difficulties and lead to pneumonia and pulmonary edema, which may be fatal. Other symptoms may include coughing, choking, and irritation of the nose, throat, and respiratory tract.
**Ingestion:**
Corrosive! Swallowing nitric acid can cause immediate pain and burns of the mouth, throat, esophagus and gastrointestinal tract.
**Skin Contact:**
Corrosive! Can cause redness, pain, and severe skin burns. Concentrated solutions cause deep ulcers and stain skin a yellow or yellow-brown color.
**Eye Contact:**
Corrosive! Vapors are irritating and may cause damage to the eyes. Contact may cause severe burns and permanent eye damage.
**Chronic Exposure:**
Long-term exposure to concentrated vapors may cause erosion of teeth and lung damage. Long-term exposures seldom occur due to the corrosive properties of the acid.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing skin disorders, eye disease, or cardiopulmonary diseases may be more susceptible to the effects of this substance.

---

# 4. First Aid Measures

Immediate first aid treatment reduces the health effects of this substance.
**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
**Ingestion:**

DO NOT INDUCE VOMITING! Give large quantities of water or milk if available. Never give anything by mouth to an unconscious person. Get medical attention immediately.

**Skin Contact:**

In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

---

# 5. Fire Fighting Measures

**Fire:**

Not combustible, but substance is a strong oxidizer and its heat of reaction with reducing agents or combustibles may cause ignition. Can react with metals to release flammable hydrogen gas.

**Explosion:**

Reacts explosively with combustible organic or readily oxidizable materials such as: alcohols, turpentine, charcoal, organic refuse, metal powder, hydrogen sulfide, etc. Reacts with most metals to release hydrogen gas which can form explosive mixtures with air.

**Fire Extinguishing Media:**

Water spray may be used to keep fire exposed containers cool. Do not get water inside container.

**Special Information:**

Increases the flammability of combustible, organic and readily oxidizable materials. In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

---

# 6. Accidental Release Measures

Ventilate area of leak or spill. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Neutralize with alkaline material (soda ash, lime), then absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker NEUTRASORB® or TEAM® 'Low Na+' acid neutralizers are recommended for spills of this product.

---

# 7. Handling and Storage

Store in a cool, dry, ventilated storage area with acid resistant floors and good drainage. Protect from physical damage. Keep out of direct sunlight and away from heat, water, and incompatible materials. Do not wash out container and use it for other purposes. When diluting, the acid should always be added slowly to water and in small amounts. Never use hot water and never add water to the acid. Water added to acid can cause uncontrolled boiling and splashing. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
-OSHA Permissible Exposure Limit (PEL):
2 ppm (TWA), 4 ppm (STEL)
-ACGIH Threshold Limit Value (TLV):
2 ppm (TWA); 4 ppm (STEL)

**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. Nitric acid is an oxidizer and should not come in contact with cartridges and canisters that contain oxidizable materials, such as activated charcoal. Canister-type respirators using sorbents are ineffective.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.
**Eye Protection:**
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
Colorless to yellowish liquid.
**Odor:**
Suffocating, acrid.
**Solubility:**
Infinitely soluble.

**Specific Gravity:**
1.41
**pH:**
1.0 (0.1M solution)
**% Volatiles by volume @ 21C (70F):**
100 (as water and acid)
**Boiling Point:**
122C (252F)
**Melting Point:**
-42C (-44F)
**Vapor Density (Air=1):**
2-3
**Vapor Pressure (mm Hg):**
48 @ 20C (68F)
**Evaporation Rate (BuAc=1):**
No information found.

---

## 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage. Containers may burst when heated.
**Hazardous Decomposition Products:**
When heated to decomposition, emits toxic nitrogen oxides fumes and hydrogen nitrate. Will react with water or steam to produce heat and toxic and corrosive fumes.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
A dangerously powerful oxidizing agent, concentrated nitric acid is incompatible with most substances, especially strong bases, metallic powders, carbides, hydrogen sulfide, turpentine, and combustible organics.
**Conditions to Avoid:**
Light and heat.

---

## 11. Toxicological Information

Nitric acid: Inhalation rat LC50: 244 ppm (NO2)/30M; Investigated as a mutagen, reproductive effector. Oral (human) LDLo: 430 mg/kg.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Nitric Acid (7697-37-2) | No | No | None |
| Water (7732-18-5) | No | No | None |

---

## 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
No information found.

---

## 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be managed in an appropriate and approved waste facility. Although not a listed RCRA hazardous waste, this material may exhibit one or more characteristics of a hazardous waste and require appropriate analysis to determine specific disposal requirements. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

---

## 14. Transport Information

**Domestic (Land, D.O.T.)**
---
**Proper Shipping Name:** NITRIC ACID (WITH NOT MORE THAN 70% NITRIC ACID)

**Hazard Class:** 8
**UN/NA:** UN2031
Packing Group: II
**Information reported for product/size:** 150LB

**International (Water, I.M.O.)**
---
**Proper Shipping Name:** NITRIC ACID (WITH NOT MORE THAN 70% NITRIC ACID)

**Hazard Class:** 8
**UN/NA:** UN2031
Packing Group: II
**Information reported for product/size:** 150LB

**International (Air, I.C.A.O.)**
---
**Proper Shipping Name:** NITRIC ACID (WITH NOT MORE THAN 70% NITRIC ACID)

**Hazard Class:** 8
**UN/NA:** UN2031
Packing Group: II
**Information reported for product/size:** 150LB

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\--------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Nitric Acid (7697-37-2) | Yes | Yes | Yes | Yes |
| Water (7732-18-5) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\--------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Nitric Acid (7697-37-2) | Yes | Yes | No | Yes |
| Water (7732-18-5) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\--------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Nitric Acid (7697-37-2) | 1000 | 1000 | Yes | No |
| Water (7732-18-5) | No | No | No | No |

--------\Federal, State & International Regulations - Part 2\--------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Nitric Acid (7697-37-2) | 1000 | No | No |
| Water (7732-18-5) | No | No | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: No
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Mixture / Liquid)

**Australian Hazchem Code:** 2PE
**Poison Schedule:** S6
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

# 16. Other Information

**NFPA Ratings:** Health: **3** Flammability: **0** Reactivity: **0** Other: **Oxidizer**
**Label Hazard Warning:**
POISON! DANGER! STRONG OXIDIZER. CONTACT WITH OTHER MATERIAL MAY CAUSE FIRE. CORROSIVE. LIQUID AND MIST CAUSE SEVERE BURNS TO ALL BODY TISSUE. MAY BE FATAL IF SWALLOWED OR INHALED. INHALATION MAY CAUSE LUNG AND TOOTH DAMAGE.

**Label Precautions:**
Do not get in eyes, on skin, or on clothing.
Do not breathe vapor or mist.
Use only with adequate ventilation.
Wash thoroughly after handling.
Keep from contact with clothing and other combustible materials.
Do not store near combustible materials.
Store in a tightly closed container.
Remove and wash contaminated clothing promptly.

**Label First Aid:**
In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases get medical attention immediately.

**Product Use:**
Laboratory Reagent.

**Revision Information:**
MSDS Section(s) changed since last revision of document include: 16.

**Disclaimer:**
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**********

**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

**MSDS** Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Rod School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-800-582-2537) for assistance.

# METHYL ETHYL KETONE

**MSDS Number: M4628 --- *Effective Date: 08/02/01***

## 1. Product Identification

**Synonyms:** 2-Butanone; ethyl methyl ketone; MEK; Methyl acetone
**CAS No.:** 78-93-3
**Molecular Weight:** 72.11
**Chemical Formula:** CH3COCH2CH3
**Product Codes:** J.T. Baker: 5385, 5808, 9214, 9319, 9323, Q531
Mallinckrodt: 6206, 6233, 6240, 6243

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Methyl Ethyl Ketone | 78-93-3 | 99 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL OR FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.**

**J.T. Baker SAF-T-DATA(tm) Ratings (Provided here for your convenience)**

---

Health Rating: 2 - Moderate
Flammability Rating: 4 - Extreme (Flammable)
Reactivity Rating: 2 - Moderate
Contact Rating: 2 - Moderate
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES; CLASS B EXTINGUISHER
Storage Color Code: Red (Flammable)

---

**Potential Health Effects**

---

**Inhalation:**
Causes irritation to the nose and throat. Concentrations above the TLV may cause headache, dizziness, nausea, shortness of breath, and vomiting. Higher concentrations may cause central nervous system depression and unconsciousness.
**Ingestion:**
May produce abdominal pain, nausea. Aspiration into lungs can produce severe lung damage and is a medical emergency. Other symptoms expected to parallel inhalation.
**Skin Contact:**
Causes irritation to skin. Symptoms include redness, itching, and pain. May be absorbed through the skin with possible systemic effects.
**Eye Contact:**
Vapors are irritating to the eyes. Splashes can produce painful irritation and eye damage.
**Chronic Exposure:**
Prolonged skin contact may defat the skin and produce dermatitis. Chronic exposure may cause central nervous system effects.
**Aggravation of Pre-existing Conditions:**
Persons with pre-existing skin disorders or eye problems or impaired respiratory function may be more susceptible to the effects of the substance.

---

# 4. First Aid Measures

**Inhalation:**
Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.
**Ingestion:**
Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. Call a physician immediately.
**Skin Contact:**
Immediately flush skin with plenty of soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.
**Eye Contact:**

Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention.

## 5. Fire Fighting Measures

**Fire:**
Flash point: -9C (16F) CC
Autoignition temperature: 404C (759F)
Flammable limits in air % by volume:
lel: 1.4; uel: 11.4
Extremely Flammable.
**Explosion:**
Above flash point, vapor-air mixtures are explosive within flammable limits noted above. Vapors can flow along surfaces to distant ignition source and flash back. Contact with strong oxidizers may cause fire. Sealed containers may rupture when heated. Sensitive to static discharge.
**Fire Extinguishing Media:**
Dry chemical, foam or carbon dioxide. Water spray may be used to keep fire exposed containers cool, dilute spills to nonflammable mixtures, protect personnel attempting to stop leak and disperse vapors.
**Special Information:**
In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. This highly flammable liquid must be kept from sparks, open flame, hot surfaces, and all sources of heat and ignition.

## 6. Accidental Release Measures

Ventilate area of leak or spill. Remove all sources of ignition. Wear appropriate personal protective equipment as specified in Section 8. Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Contain and recover liquid when possible. Use non-sparking tools and equipment. Collect liquid in an appropriate container or absorb with an inert material (e. g., vermiculite, dry sand, earth), and place in a chemical waste container. Do not use combustible materials, such as saw dust. Do not flush to sewer! If a leak or spill has not ignited, use water spray to disperse the vapors, to protect personnel attempting to stop leak, and to flush spills away from exposures. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

J. T. Baker SOLUSORB® solvent adsorbent is recommended for spills of this product.

## 7. Handling and Storage

Protect against physical damage. Store in a cool, dry well-ventilated location, away from any area where the fire hazard may be acute. Outside or detached storage is preferred. Separate from incompatibles. Containers should be bonded and grounded for transfers to avoid static sparks. Storage and use areas should be No Smoking areas. Use non-sparking type tools and equipment, including explosion proof ventilation. Containers of this material may be hazardous when empty since they retain product residues (vapors, liquid); observe all warnings and precautions listed for the product.

---

# 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**
-OSHA Permissible Exposure Limit (PEL):
200 ppm (TWA)

-ACGIH Threshold Limit Value (TLV):
200 ppm (TWA), 300 ppm (STEL)
**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details. Use explosion-proof equipment.
**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded and engineering controls are not feasible, a full facepiece respirator with organic vapor cartridge may be worn up to 50 times the exposure limit or the maximum use concentration specified by the appropriate regulatory agency or respirator supplier, whichever is lowest. For emergencies or instances where the exposure levels are not known, use a full-facepiece positive-pressure, air-supplied respirator. WARNING: Air purifying respirators do not protect workers in oxygen-deficient atmospheres.
**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact. Butyl rubber is a suitable material for personal protective equipment.
**Eye Protection:**
Use chemical safety goggles and/or a full face shield where splashing is possible. Maintain eye wash fountain and quick-drench facilities in work area.

---

# 9. Physical and Chemical Properties

**Appearance:**
Clear, colorless liquid.
**Odor:**
Sharp mint-like odor.
**Solubility:**
29 g in 100 g of water.

**Specific Gravity:**
0.81 @ 20C/4C
**pH:**
No information found.
**% Volatiles by volume @ 21C (70F):**
100
**Boiling Point:**
80C (176F)
**Melting Point:**
-86C (-123F)
**Vapor Density (Air=1):**
2.5
**Vapor Pressure (mm Hg):**
78 @ 20C (68F)
**Evaporation Rate (BuAc=1):**
2.7 (Ether = 1)

---

# 10. Stability and Reactivity

**Stability:**
Stable under ordinary conditions of use and storage.
**Hazardous Decomposition Products:**
Carbon dioxide and carbon monoxide may form when heated to decomposition.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Oxidizing materials, caustics, amines, ammonia, strong bases, chloroform, chlorosulfonic acid, oleum, potassium-t-butoxide, heat or flame, hydrogen peroxide, nitric acid. Can attack many plastics, resins and rubber.
**Conditions to Avoid:**
Heat, flames, ignition sources and incompatibles.

---

# 11. Toxicological Information

**Toxicological Data:**
Oral rat LD50: 2737 mg/kg; inhalation rat LC50: 23,500 mg/m3/8-hr; skin rabbit LD50: 6480 mg/kg; investigated as a mutagen, reproductive effector.
**Reproductive Toxicity:**
Has shown teratogenic effects in laboratory animals.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Methyl Ethyl Ketone (78-93-3) | No | No | None |

# 12. Ecological Information

**Environmental Fate:**
When released into the soil, this material may leach into groundwater. When released into the soil, this material may evaporate to a moderate extent. When released into water, this material may biodegrade to a moderate extent. When released into water, this material may evaporate to a moderate extent. When released into water, this material is expected to have a half-life between 10 and 30 days. This material is not expected to significantly bioaccumulate. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days.
**Environmental Toxicity:**
This material is not expected to be toxic to aquatic life. The LC50/96-hour values for fish are over 100 mg/l.

# 13. Disposal Considerations

Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved incinerator or disposed in a RCRA approved waste facility. Processing, use or contamination of this product may change the waste management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

# 14. Transport Information

**Domestic (Land, D.O.T.)**
---
**Proper Shipping Name:** ETHYL METHYL KETONE
**Hazard Class:** 3
**UN/NA:** UN1193
Packing Group: II
**Information reported for product/size:** 366LB

**International (Water, I.M.O.)**
---
**Proper Shipping Name:** ETHYL METHYL KETONE
**Hazard Class:** 3
**UN/NA:** UN1193
Packing Group: II
**Information reported for product/size:** 366LB

# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Methyl Ethyl Ketone (78-93-3) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\---------------------------------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Methyl Ethyl Ketone (78-93-3) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Methyl Ethyl Ketone (78-93-3) | No | No | Yes | No |

--------\Federal, State & International Regulations - Part 2\----------------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Methyl Ethyl Ketone (78-93-3) | 5000 | U159 | No |

Chemical Weapons Convention: No TSCA 12(b): No CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: Yes Pressure: No
Reactivity: No (Pure / Liquid)

**Australian Hazchem Code:** 2[Y]E
**Poison Schedule:** S5
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

---

# 16. Other Information

**NFPA Ratings:** Health: **3** Flammability: **3** Reactivity: **0**
**Label Hazard Warning:**
DANGER! EXTREMELY FLAMMABLE LIQUID AND VAPOR. VAPOR MAY CAUSE FLASH FIRE. HARMFUL OR FATAL IF SWALLOWED. HARMFUL IF INHALED OR ABSORBED THROUGH SKIN. AFFECTS CENTRAL NERVOUS SYSTEM. CAUSES IRRITATION TO SKIN, EYES AND RESPIRATORY TRACT.
**Label Precautions:**
Keep away from heat, sparks and flame.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
Avoid breathing vapor.

Avoid contact with eyes, skin and clothing.

**Label First Aid:**

Aspiration hazard. If swallowed, vomiting may occur spontaneously, but DO NOT INDUCE. If vomiting occurs, keep head below hips to prevent aspiration into lungs. Never give anything by mouth to an unconscious person. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. In all cases, get medical attention.

**Product Use:**

Laboratory Reagent.

**Revision Information:**

MSDS Section(s) changed since last revision of document include: 8.

**Disclaimer:**

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**Prepared by:** Environmental Health & Safety
Phone Number: (314) 654-1600 (U.S.A.)

# Material Safety Data Sheet

## Chevron Supreme Motor Oil

**MSDS:** 6717 **Revision #:** 2 **Revision Date:** 11/08/00

**Click here to search the product data sheet database**

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1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

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CHEVRON Supreme Motor Oil

PRODUCT NUMBER(S): CPS220002 CPS220011 CPS220013 CPS220019
CPS220059 CPS220060

SYNONYM: CHEVRON Supreme Motor Oil SAE 10W-30
CHEVRON Supreme Motor Oil SAE 10W-40
CHEVRON Supreme Motor Oil SAE 20W-50
CHEVRON Supreme Motor Oil SAE 30
CHEVRON Supreme Motor Oil SAE 40
CHEVRON Supreme Motor Oil SAE 5W-30

COMPANY IDENTIFICATION

Chevron Products Company
Lubricants and Specialty Products
6001 Bollinger Canyon Rd., T3325/B10
San Ramon, CA 94583
www.chevron-lubricants.com

EMERGENCY TELEPHONE NUMBERS

HEALTH (24 hr): (800)231-0623 or
(510)231-0623 (International)
TRANSPORTATION (24 hr): CHEMTREC
(800)424-9300 or (703)527-3887
Emergency Information Centers
are located in U.S.A.
Int'l collect calls accepted

PRODUCT INFORMATION: MSDS Request:(800)414-6737 email:lubemsds@chevron.com
Environmental, Safety, & Health Info: (925) 842-5535
Product Information: (800) 582-3835

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2. COMPOSITION/INFORMATION ON INGREDIENTS

---

100.0 % CHEVRON Supreme Motor Oil

CONTAINING

| COMPONENTS | AMOUNT | LIMIT/QTY | AGENCY/TYPE |
|---|---|---|---|
| LUBRICATING BASE OIL SEVERELY REFINED PETROLEUM DISTILLATE | > 75.00% | 5 mg/m3 (mist) | ACGIH TWA |
| | | 10 mg/m3 (mist) | ACGIH STEL |
| | | 5 mg/m3 (mist) | OSHA PEL |

The BASE OIL may be a mixture of any of the following: CAS 64741884, CAS 64741895, CAS 64741964, CAS 64741975, CAS 64742014, CAS 64742525, CAS 64742536, CAS 64742547, CAS 64742627, CAS 64742650, or CAS 72623837.

ADDITIVES INCLUDING THE FOLLOWING
< 25.00%

ZINC ALKYL DITHIOPHOSPHATE
Chemical Name: PHOSPHORODITHIOIC ACID,O,O-DI-C1-14-ALKYL ESTERS, ZINC SALT
CAS68649423 < 1.50% NONE NA

COMPOSITION COMMENT:
All the components of this material are on the Toxic Substances Control Act Chemical Substances Inventory.

This product fits the ACGIH definition for mineral oil mist. The ACGIH TLV is 5 mg/m3, the OSHA PEL is 5 mg/m3.

## 3. HAZARDS IDENTIFICATION

IMMEDIATE HEALTH EFFECTS
EYE:
Not expected to cause prolonged or significant eye irritation.
SKIN:
Contact with the skin is not expected to cause prolonged or significant irritation. Not expected to be harmful to internal organs if absorbed through the skin.
INGESTION:
Not expected to be harmful if swallowed.
INHALATION:
Contains a petroleum-based mineral oil. May cause respiratory irritation or other pulmonary effects following prolonged or repeated inhalation of oil mist at airborne levels above the recommended mineral oil mist exposure limit.

## 4. FIRST AID MEASURES

EYE:
No specific first aid measures are required because this material is not expected to cause eye irritation. As a precaution remove contact lenses, if worn, and flush eyes with water.
SKIN:
No specific first aid measures are required because this material is not expected to be harmful if it contacts the skin. As a precaution, remove clothing and shoes if contaminated. Wash skin with soap and water. Wash or clean contaminated clothing and shoes before reuse.
INGESTION:
No specific first aid measures are required because this material is not expected to be harmful if swallowed. Do not induce vomiting. As a precaution, give the person a glass of water or milk to drink and get medical advice. Never give anything by mouth to an unconscious person.
INHALATION:
If exposed to excessive levels of material in the air, move the exposed

person to fresh air. Get medical attention if coughing or respiratory discomfort occurs.

## 5. FIRE FIGHTING MEASURES

FIRE CLASSIFICATION:
Classification (29 CFR 1910.1200): Not classified by OSHA as flammable or combustible.
FLAMMABLE PROPERTIES:
FLASH POINT: (COC) 388F (198C) Min.
AUTOIGNITION: NDA
FLAMMABILITY LIMITS (% by volume in air): Lower: NA Upper: NA
EXTINGUISHING MEDIA:
CO2, Dry Chemical, Foam, Water Fog
NFPA RATINGS: Health 1; Flammability 1; Reactivity 0.
FIRE FIGHTING INSTRUCTIONS:
This material will burn although it is not easily ignited. For fires involving this material, do not enter any enclosed or confined fire space without proper protective equipment, including self-contained breathing apparatus.
COMBUSTION PRODUCTS:
Normal combustion forms carbon dioxide, water vapor and may produce oxides of sulfur, nitrogen and phosphorus. Incomplete combustion can produce carbon monoxide.

## 6. ACCIDENTAL RELEASE MEASURES

CHEMTREC EMERGENCY NUMBER (24 hr): (800)424-9300 or (703)527-3887
International Collect Calls Accepted
ACCIDENTAL RELEASE MEASURES:
Stop the source of the leak or release. Clean up releases as soon as possible. Contain liquid to prevent further contamination of soil, surface water or groundwater. Clean up small spills using appropriate techniques such as sorbent materials or pumping. Where feasible and appropriate, remove contaminated soil. Follow prescribed procedures for reporting and responding to larger releases.

## 7. HANDLING AND STORAGE

Container is not designed to contain pressure. Do not use pressure to empty container or it may rupture with explosive force. Empty containers retain product residue (solid, liquid, and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition. They may explode and cause injury or death. Empty containers should be completely drained, properly closed, and promptly returned to a drum reconditioner, or properly disposed of. Avoid contaminating soil or releasing this material into sewage and drainage systems and bodies of water.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

GENERAL CONSIDERATIONS:
Consider the potential hazards of this material (see Section 3), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

ENGINEERING CONTROLS
Use in a well-ventilated area. If user operations generate an oil mist, use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below the recommended mineral oil mist exposure limits.

PERSONAL PROTECTIVE EQUIPMENT
EYE/FACE PROTECTION:
No special eye protection is normally required. Where splashing is possible, wear safety glasses with side shields as a good safety practice.
SKIN PROTECTION:
No special protective clothing is normally required. Where splashing is possible, select protective clothing depending on operations conducted, physical requirements and other substances. Suggested materials for protective gloves include: <Viton> <Nitrile> <Silver Shield> <4H>
RESPIRATORY PROTECTION:
No respiratory protection is normally required. If user operations generate an oil mist, determine if airborne concentrations are below the recommended mineral oil mist exposure limits. If not wear a NIOSH approved respirator that provides adequate protection from measured concentrations of this material. Use the following elements for air-purifying respirators: particulate.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL DESCRIPTION:
Amber liquid.

| | |
|---|---|
| pH: | NA |
| VAPOR PRESSURE: | <0.01 mm Hg at 100F |
| VAPOR DENSITY (AIR=1): | Heavier than air. |
| BOILING POINT: | >600F (>315C) |
| FREEZING POINT: | NA |
| MELTING POINT: | NA |
| SOLUBILITY: | Soluble in hydrocarbon solvents; insoluble in water. |
| SPECIFIC GRAVITY: | 0.87 - 0.89 @ 15.6/15.6C |
| VOLATILE ORGANIC COMPOUNDS (VOC): | <1 wt.%, 8.69 g/l (approx.) |
| VISCOSITY: | 10.0 - 18.4 cSt @ 100C (Min.) |

## 10. STABILITY AND REACTIVITY

HAZARDOUS DECOMPOSITION PRODUCTS:
H2S may be released at high temperatures.
CHEMICAL STABILITY:

Stable.
CONDITIONS TO AVOID:
No data available.
INCOMPATIBILITY WITH OTHER MATERIALS:
May react with strong oxidizing agents, such as chlorates, nitrates, peroxides, etc.
HAZARDOUS POLYMERIZATION:
Polymerization will not occur.

## 11. TOXICOLOGICAL INFORMATION

EYE EFFECTS:
The eye irritation hazard is based on data for a similar material.
SKIN EFFECTS:
The skin irritation hazard is based on data for a similar material.
ACUTE ORAL EFFECTS:
The acute oral toxicity is based on data for a similar material.
ACUTE INHALATION EFFECTS:
The acute respiratory toxicity is based on data for a similar material.
ADDITIONAL TOXICOLOGY INFORMATION:
This product contains petroleum base oils which may be refined by various processes including severe solvent extraction, severe hydrocracking, or severe hydrotreating. None of the oils requires a cancer warning under the OSHA Hazard Communication Standard (29 CFR 1910.1200). These oils have not been listed in the National Toxicology Program (NTP) Annual Report nor have they been classified by the International Agency for Research on Cancer (IARC) as; carcinogenic to humans (Group 1), probably carcinogenic to humans (Group 2A), or possibly carcinogenic to humans (Group 2B).

This product contains zinc alkyl dithiophosphates (ZDDPs). Several ZDDPs have been reported to have weak mutagenic activity in cultured mammalian cells but only at concentrations that were toxic to the test cells. We do not believe that there is any mutagenic risk to workers exposed to ZDDPs.

During use in engines, contamination of oil with low levels of cancer-causing combustion products occurs. Used motor oils have been shown to cause skin cancer in mice following repeated application and continuous exposure. Brief or intermittent skin contact with used motor oil is not expected to have serious effects in humans if the oil is thoroughly removed by washing with soap and water. See Chevron Material Safety Data Sheet No. 1793 for additional information on used motor oil.

## 12. ECOLOGICAL INFORMATION

ECOTOXICITY:
The toxicity of this material to aquatic organisms has not been evaluated. Consequently, this material should be kept out of sewage and drainage systems and all bodies of water.
ENVIRONMENTAL FATE:
This material is not expected to be readily biodegradable.

## 13. DISPOSAL CONSIDERATIONS

Oil collection services and collection centers are available for used motor oil recycling or disposal. Some service stations, automotive service centers, and retailers provide motor oil collection facilities.

Place contaminated materials in containers and dispose of in a manner consistent with applicable regulations. Contact your sales representative or local environmental or health authorities for approved disposal or recycling methods.

## 14. TRANSPORT INFORMATION

The description shown may not apply to all shipping situations. Consult 49CFR, or appropriate Dangerous Goods Regulations, for additional description requirements (e.g., technical name) and mode-specific or quantity-specific shipping requirements.

DOT SHIPPING NAME: NONE
DOT HAZARD CLASS: NONE
DOT IDENTIFICATION NUMBER: NONE
DOT PACKING GROUP: N/A
ADDITIONAL INFO: Petroleum Lubricating Oil - Not Hazardous by U.S. DOT.
ADR/RID Hazard class - Not applicable.

## 15. REGULATORY INFORMATION

| | | |
|---|---|---|
| SARA 311 CATEGORIES: | 1. Immediate (Acute) Health Effects: | NO |
| | 2. Delayed (Chronic) Health Effects: | NO |
| | 3. Fire Hazard: | NO |
| | 4. Sudden Release of Pressure Hazard: | NO |
| | 5. Reactivity Hazard: | NO |

REGULATORY LISTS SEARCHED:

| | | |
|---|---|---|
| 01=SARA 313 | 11=NJ RTK | 22=TSCA Sect 5(a)(2) |
| 02=MASS RTK | 12=CERCLA 302.4 | 23=TSCA Sect 6 |
| 03=NTP Carcinogen | 13=MN RTK | 24=TSCA Sect 12(b) |
| 04=CA Prop 65-Carcin | 14=ACGIH TWA | 25=TSCA Sect 8(a) |
| 05=CA Prop 65-Repro Tox | 15=ACGIH STEL | 26=TSCA Sect 8(d) |
| 06=IARC Group 1 | 16=ACGIH Calc TLV | 27=TSCA Sect 4(a) |
| 07=IARC Group 2A | 17=OSHA PEL | 28=Canadian WHMIS |
| 08=IARC Group 2B | 18=DOT Marine Pollutant | 29=OSHA CEILING |
| 09=SARA 302/304 | 19=Chevron TWA | 30=Chevron STEL |
| 10=PA RTK | 20=EPA Carcinogen | |

The following components of this material are found on the regulatory lists indicated.

PHOSPHORODITHIOIC ACID,O,O-DI-C1-14-ALKYL ESTERS, ZINC SALTS
is found on lists: 01,11,
SEVERELY REFINED PETROLEUM DISTILLATE
is found on lists: 14,15,17,

NEW JERSEY RTK CLASSIFICATION:
Under the New Jersey Right-to-Know Act L. 1983 Chapter 315 N.J.S.A. 34:5A-1 et. seq., the product is to be identified as follows:

PETROLEUM OIL
WHMIS CLASSIFICATION:
This product is not considered a controlled product according to the criteria of the Canadian Controlled Products Regulations.

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16. OTHER INFORMATION

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NFPA RATINGS: Health 1; Flammability 1; Reactivity 0;
HMIS RATINGS: Health 1; Flammability 1; Reactivity 0;
(0-Least, 1-Slight, 2-Moderate, 3-High, 4-Extreme, PPE:- Personal Protection Equipment Index recommendation, *- Chronic Effect Indicator). These values are obtained using the guidelines or published evaluations prepared by the National Fire Protection Association (NFPA) or the National Paint and Coating Association (for HMIS ratings).

REVISION STATEMENT:
This revision updates Section 4 (First Aid Measures), Section 9 (Physical and Chemical Properties), and Section 15 (Regulatory Information).

ABBREVIATIONS THAT MAY HAVE BEEN USED IN THIS DOCUMENT:

| | | | |
|---|---|---|---|
| TLV | - Threshold Limit Value | TWA | - Time Weighted Average |
| STEL | - Short-term Exposure Limit | TPQ | - Threshold Planning Quantity |
| RQ | - Reportable Quantity | PEL | - Permissible Exposure Limit |
| C | - Ceiling Limit | CAS | - Chemical Abstract Service Number |
| A1-5 | - Appendix A Categories | () | - Change Has Been Proposed |
| NDA | - No Data Available | NA | - Not Applicable |

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Prepared according to the OSHA Hazard Communication Standard (29 CFR 1910.1200) and the ANSI MSDS Standard (Z400.1) by the Toxicology and Health Risk Assessment Unit, CRTC, P.O. Box 1627, Richmond, CA 94804

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The above information is based on the data of which we are aware and is believed to be correct as of the date hereof. Since this information may be applied under conditions beyond our control and with which we may be unfamiliar and since data made available subsequent to the date hereof may suggest modification of the information, we do not assume any responsibility for the results of its use. This information is furnished upon condition that the person receiving it shall make his own determination of the suitability of the material for his particular purpose.

**********

THIS IS THE LAST PAGE OF THIS MSDS

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CYTEC

# MATERIAL SAFETY DATA

MSDS No: 0243
Date: 07/01/97
Supersedes: 12/12/96

## 1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **Sulfuric Acid,60 degree Be',66 degree Be', 98-100%**

SYNONYMS: Sulfuric acid; oil of vitriol; sulfuric acid, 77%; electrolyte grade; codex food grade; 1.835 sulfuric acid; 93% sulfuric acid; 96% sulfuric acid

CHEMICAL FAMILY: Inorganic acid

MOLECULAR FORMULA: H2S04

MOLECULAR WGT: 98.00

CYTEC INDUSTRIES INC., FIVE GARRET MOUNTAIN PLAZA, WEST PATERSON, NEW JERSEY 07424, USA
For Product Information call 1-800/652-6013. Outside the USA and Canada call 973/357-3193.
EMERGENCY PHONE: For emergency involving spill, leak, fire, exposure or accident call CHEMTREC: 1-800/424-9300. Outside the USA and Canada call 703/527-3887.

## 2. COMPOSITION/INFORMATION ON INGREDIENTS

OSHA REGULATED COMPONENTS

| COMPONENT | CAS. NO. | % | TWA/CEILING | REFERENCE |
|---|---|---|---|---|
| Sulfuric Acid | 007664-93-9 | ~80-100 | 1 mg/M3<br>3 mg/M3 STEL | OSHA/ACGIH<br>ACGIH |

## 3. HAZARDS IDENTIFICATION

### EMERGENCY OVERVIEW

APPEARANCE AND ODOR: Clear to slightly cloudy, oily liquid; odorless to slightly pungent odor

STATEMENTS OF HAZARD:
DANGER! CAUSES SEVERE BURNS OF EYES AND SKIN

### POTENTIAL HEALTH EFFECTS

EFFECTS OF OVEREXPOSURE:
Direct contact with this material may cause severe eye and skin irritation.
Refer to Section 11 for toxicology information on the OSHA regulated components of this product.

## 4. FIRST AID MEASURES

In case of skin contact, remove contaminated clothing without delay. Wear impervious gloves. Cleanse skin thoroughly with soap and water. Do not omit cleaning hair or under fingernails if contaminated. Do not reuse clothing without laundering. Do not reuse contaminated leatherware.
In case of eye contact, immediately irrigate with plenty of water for 15 minutes. Obtain medical attention without delay.
If vapor of this material is inhaled, remove from exposure. Administer oxygen if there is difficulty in breathing. Give artificial respiration if person is not breathing and continue until normal breathing is established. Obtain medical attention without delay.

## 5. FIRE FIGHTING MEASURES

### FLAMMABLE PROPERTIES

FLASH POINT: Not applicable

FLAMMABLE LIMITS
(% BY VOL): Not applicable

AUTOIGNITION TEMP: Not available

DECOMPOSITION TEMP: Not available

### EXTINGUISHING MEDIA AND FIRE FIGHTING INSTRUCTIONS

Sulfuric acid will not burn, but it is capable of igniting finely divided combustible materials on contact. May react violently with organic materials and water with the evolution of heat. Fires involving a small amount of combustibles may be smothered by dry chemical. Use water on combustibles burning in vicinity of acid but use care as water applied to the acid results in severe generation of heat and may cause boiling and splattering. Wear self-contained, positive pressure breathing apparatus and full firefighting protective clothing. See Section 8 (Exposure Controls/Personal Protection) for special protective clothing.

## 6. ACCIDENTAL RELEASE MEASURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED

Where exposure level is not known, wear NIOSH approved positive pressure self-contained respirator. Where exposure level is known, wear NIOSH approved respirator suitable for level of exposure. Wear the same protective equipment as in Exposure Control Methods, except acid hood and suit should be worn when spraying or splashing can occur. Dilute spill cautiously with 5 or 6 volumes of water and neutralize gradually with soda ash or lime. Do not allow unneutralized acid to get into sewers containing sulfides, because of the danger of evolving hydrogen sulfide gas.

## 7. HANDLING AND STORAGE

Do not get in eyes, on skin, on clothing. Wash thoroughly after handling. Do not add water to contents while in a container because of violent reaction.

Sulfuric acid attacks many metals, releasing flammable hydrogen gas. Extremely hazardous in contact with many materials, particularly explosives. Hydrogen gas can accumulate in metal tanks containing acid. Do not smoke or have other sources of ignition around open drums or tanks containing acid. When diluting, always add acid to water. Never add water to acid. Protect against physical damage to containers and contact with incompatible materials. Do not strike tank fittings with tools or other hard objects.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS AND PERSONAL PROTECTIVE EQUIPMENT (PPE)

Utilize a closed system process where feasible. Where this material is not used in a closed system, good enclosure and local exhaust ventilation should be provided to control exposure. Food, beverages, and tobacco products should not be carried, stored, or consumed where this material is in use. Before eating, drinking, or smoking, wash face and hands with soap and water. Prevent eye and skin contact. Wear the special protective equipment specified below for operations where eye or skin contact can occur. Prevent contamination of skin or clothing when removing protective equipment. Provide eyewash fountain and safety shower in close proximity to points of potential exposure. Where exposures are below the PEL, no respiratory protection is required. Where exposures exceed the PEL, use respirator approved by NIOSH or full protective suit with air supply appropriate for the material and level of exposure. See "GUIDE TO INDUSTRIAL RESPIRATORY PROTECTION"(NIOSH).

Special protective equipment - To prevent skin contact wear skin protection, such as impervious gloves, apron, workpants, long sleeve workshirt, or disposable coveralls. To prevent eye contact wear eye protection such as chemical splash proof goggles or face shield.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR: Clear to slightly cloudy, oily liquid; odorless to slightly pungent odor

BOILING POINT: 640 F; 338 C; Not applicable

MELTING POINT: 37-51 F; 3-11 C; (values for sulfuric acid 98% and 100%, respectively)

VAPOR PRESSURE: Variable function of temperature and concentration

SPECIFIC GRAVITY: 1.4-1.8

VAPOR DENSITY: Not available

% VOLATILE (BY WT): 0-20; (water)

pH: 2.1; 0.01 N; 0.10 N=1.2; 1.0 N=0.3

SATURATION IN AIR (% BY VOL): Not available

EVAPORATION RATE: Not available

SOLUBILITY IN WATER: Complete

## 10. STABILITY AND REACTIVITY

STABILITY: Stable
CONDITIONS TO AVOID: None known

POLYMERIZATION: Will Not Occur
CONDITIONS TO AVOID: None known

INCOMPATIBLE MATERIALS: Water, many metals, and strong alkali materials. Contact with carbides, chlorates, fulminates, nitrates, or picrates may cause violent reaction/explosion or form unstable compounds. Contact with organic materials, particularly with organic acids, acetates and anhydrides may result in highly exothermic reaction. Contact with metal may release explosive hydrogen gas. Contact with finely divided organic material may cause fire.

HAZARDOUS DECOMPOSITION PRODUCTS: Thermal decomposition or combustion may produce sulfur trioxide and/or sulfur dioxide. Toxic and explosive hydrogen sulfide may be formed under certain conditions.

## 11. TOXICOLOGICAL INFORMATION

Toxicological information for the product is found under Section 3. HAZARDS IDENTIFICATION. Toxicological information on the OSHA regulated components of this product is as follows:

The acute oral (rat) LD50 and acute 1-hour inhalation (rat) for sulfuric acid are 2,140 mg/kg and 347 ppm (0.348 mg/L/4hr), respectively. Sulfuric acid is corrosive to the skin and eyes. Concentrated sulfuric acid can also be corrosive to the nose, muscous membranes, respiratory tract and gastrointestinal tract. Inhalation of the vapors or mist can cause pulmonary edema, emphysema or permanent changes in pulmonary function. Chronic exposure has been reported to be associated with dermatitis, chronic bronchitis, gastritis, erosion of dental enamel, conjunctivitis, increased frequency of respiratory tract infections and cancer of the larynx, lungs and upper respiratory tract.

## 12. ECOLOGICAL INFORMATION

No aquatic LC50, BOD, or COD data available.

OCTANOL/$H_2O$ PARTITION COEF.: Not applicable

## 13. DISPOSAL CONSIDERATIONS

The information on RCRA waste classification and disposal methodology provided below applies only to the Cytec product, as supplied. If the material has been altered or contaminated, or it has exceeded its recommended shelf life, the guidance may be inapplicable. Hazardous waste classification under federal regulations (40 CFR Part 261 et seq) is dependent upon whether a material is a RCRA "listed hazardous waste" or has any of the four RCRA "hazardous waste characteristics." Refer to 40 CFR Part 261.33 to determine if a given material to be disposed of is a RCRA "listed hazardous waste"; information contained in Section 15 of this MSDS is not intended to indicated if the product is a "listed hazardous waste." RCRA Hazardous Waste Characteristic. There are four characteristics defined in 40 CFR Section 261.21-61.24: Ignitability, Corrosivity, Reactivity, and Toxicity. To determine Ignitability, see Section 5 of this MSDS (flash point). For Corrosivity, see Sections 9 and 14 (pH and DOT corrosivity). For Reactivity, see Section 10 (incompatible materials). For

Toxicity, see Section 2 (composition). Federal regulations are subject to change. State and local requirements, which may differ from or be more stringent than the federal regulations, may also apply to the classification of the material if it is to be disposed. Cytec encourages the recycle, recovery and reuse of materials, where permitted, as an alternate to disposal as a waste. Cytec recommends that organic materials classified as RCRA hazardous wastes be disposed of by thermal treatment or incineration at EPA approved facilities. Cytec has provided the foregoing for information only; the person generating the waste is responsible for determining the waste classification and disposal method.

## 14. TRANSPORT INFORMATION

*This section provides basic shipping classification information. Refer to appropriate* transportation regulations for specific requirements.

| | D.O.T. SHIPPING INFORMATION | IMO SHIPPING INFORMATION |
|---|---|---|
| SHIPPING NAME: | SULFURIC ACID | SULPHURIC ACID |
| HAZARD CLASS/ PACKING GROUP: | 8<br>II | 8<br>II |
| UN NUMBER: | UN1830 | 1830 |
| IMDG PAGE: | Not Applicable | 8230 |
| D.O.T. HAZARDOUS SUBSTANCES: | (PRODUCT REPORTABLE QUANTITY)<br>SULFURIC ACID<br>(1,073 lbs.) | Not Applicable |
| TRANSPORT LABEL REQUIRED: | Corrosive | Corrosive |

| | ICAO/IATA | TRANSPORT CANADA |
|---|---|---|
| SHIPPING NAME: | SULPHURIC ACID | SULPHURIC ACID |
| HAZARD CLASS: | 8 | 8 |
| SUBSIDIARY CLASS: | — | 9.2 |
| UN / ID NUMBER: | 1830 | 1830 |
| PACKING GROUP: | II | II |
| TRANSPORT LABEL REQUIRED: | Corrosive | Corrosive |
| PACKING INSTR: | PASSENGER 809<br>CARGO 813 | Not Applicable |
| MAX NET QTY: | PASSENGER 1L<br>CARGO 30L | Not Applicable |

**ADDITIONAL TRANSPORT INFORMATION**

| | |
|---|---|
| TECHNICAL NAME (N.O.S.): | Not Applicable |

# 15. REGULATORY INFORMATION

## INVENTORY INFORMATION

US TSCA: This product is manufactured in compliance with all provisions of the Toxic Substances Control Act, 15 U.S.C. 2601 et. seq.

CANADA DSL: Components of this product have been reported to Environment Canada in accordance with subsection 25 of the Canadian Environmental Protection Act and are included on the Domestic Substances List.

EEC EINECS: All components of this product are included in the European Inventory of Existing Chemical Substances (EINECS) in compliance with Council Directive 67/548/EEC and its amendments.

**OTHER ENVIRONMENTAL INFORMATION**

The following components of this product may be subject to reporting requirements pursuant to Section 313 of CERCLA (40 CFR 372), Section 12(b) of TSCA, or may be subject to release reporting requirements (40 CFR 307, 40 CFR 311, etc.) See Section 13 for information on waste classification and waste disposal of this product.

| COMPONENT | CAS. NO. | % | TPQ(lbs) | RQ(lbs) | S313 | TSCA 12B |
|---|---|---|---|---|---|---|
| Sulfuric Acid | 007664-93-9 | ~80-100 | 1000 | 1000 | YES | NO |

| PRODUCT CLASSIFICATION UNDER SECTION 311 OF SARA | | | | |
|---|---|---|---|---|
| ACUTE (Y) | CHRONIC (N) | FIRE (N) | REACTIVE (Y) | PRESSURE (N) |

# 16. OTHER INFORMATION

## NFPA HAZARD RATING (National Fire Protection Association)

Fire
0
Health 3 2 Reactivity
W
Special

FIRE: Materials that will not burn.

HEALTH: Materials which on short exposure could cause serious temporary or residual injury even though prompt medical treatment were given.

REACTIVITY: Materials which in themselves are normally unstable and readily undergo violent chemical change but do not detonate. Also materials which may react violently with water or which may form potentially explosive mixtures with water.

## REASON FOR ISSUE:

Area Code Change

Larry R. Johnson, DVM, PhD, DABT

**MSDS** Material Safety Data Sheet

From: Mallinckrodt Baker, Inc.
222 Red School Lane
Phillipsburg, NJ 08865

Mallinckrodt CHEMICALS | J.T.Baker

24 Hour Emergency Telephone: 908-859-2151
CHEMTREC: 1-800-424-9300

National Response in Canada
CANUTEC: 613-996-6666

Outside U.S. and Canada
Chemtrec: 703-527-3887

NOTE: CHEMTREC, CANUTEC and National Response Center emergency numbers to be used only in the event of chemical emergencies involving a spill, leak, fire, exposure or accident involving chemicals.

All non-emergency questions should be directed to Customer Service (1-600-582-2537) for assistance.

# SODIUM CYANIDE

**MSDS Number: S3458 --- *Effective Date: 11/17/99***

## 1. Product Identification

**Synonyms:** Hydrocyanic acid, sodium salt; Cyanogran
**CAS No.:** 143-33-9
**Molecular Weight:** 49.01
**Chemical Formula:** NaCN
**Product Codes:**
J.T. Baker: 3662, 3663
Mallinckrodt: 7616

## 2. Composition/Information on Ingredients

| Ingredient | CAS No | Percent | Hazardous |
|---|---|---|---|
| Sodium Cyanide | 143-33-9 | 90 - 100% | Yes |

## 3. Hazards Identification

**Emergency Overview**

**DANGER! MAY BE FATAL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CONTACT WITH ACIDS LIBERATES POISONOUS GAS. CAUSES BURNS TO SKIN, EYES, AND RESPIRATORY TRACT. AFFECTS**

**BLOOD, CARDIOVASCULAR SYSTEM, CENTRAL NERVOUS SYSTEM AND THYROID.**

**J.T. Baker SAF-T-DATA(tm)** Ratings (Provided here for your convenience)

---

Health Rating: 3 - Severe (Poison)
Flammability Rating: 0 - None
Reactivity Rating: 2 - Moderate
Contact Rating: 3 - Severe (Life)
Lab Protective Equip: GOGGLES; LAB COAT; VENT HOOD; PROPER GLOVES
Storage Color Code: Blue (Health)

---

**Potential Health Effects**

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In most cases, cyanide poisoning causes a deceptively healthy pink to red skin color. However, if a physical injury or lack of oxygen is involved, the skin color may be bluish. Reddening of the eyes and pupil dilation are symptoms of cyanide poisoning. Cyanosis (blue discoloration of the skin) tends to be associated with severe cyanide poisonings.

**Inhalation:**
Corrosive to the respiratory tract. The substance inhibits cellular respiration and may cause blood, central nervous system, and thyroid changes. May cause headache, weakness, dizziness, labored breathing nausea and vomiting, which can be followed by weak and irregular heart beat, unconsciousness, convulsions, coma and death.
**Ingestion:**
Highly Toxic! Corrosive to the gastro-intestinal tract with burning in the mouth and esophagus, and abdominal pain. Larger doses may produce sudden loss of consciousness and prompt death from respiratory arrest. Smaller but still lethal doses may prolong the illness for one or more hours. Bitter almonds odor may be noted on the breath or vomitus. Other symptoms may be similar to those noted for inhalation exposure.
**Skin Contact:**
Corrosive. May cause severe pain and skin burns. Solutions are corrosive to the skin and eyes, and may cause deep ulcers which heal slowly. May be absorbed through the skin, with symptoms similar to those noted for inhalation.
**Eye Contact:**
Corrosive. Symptoms may include redness, pain, blurred vision, and eye damage.
**Chronic Exposure:**
Prolonged or repeated skin exposure may cause a "cyanide" rash and nasal sores.
**Aggravation of Pre-existing Conditions:**
Workers using cyanides should have a preplacement and periodic medical exam. Those with history of central nervous system, thyroid, skin, heart or lung diseases may be more susceptible to the effects of this substance.

---

# 4. First Aid Measures

IN CASE OF CYANIDE POISONING, start first aid treatment immediately, then get

medical attention. A cyanide antidote kit (amyl nitrite, sodium nitrite and sodium thiosulfate) should be available in any cyanide work area. Actions to be taken in case of cyanide poisoning should be planned and practiced before beginning work with cyanides. Oxygen and amyl nitrite can be given by a first responder before medical help arrives. Allow victim to inhale amyl nitrite for 15-30 seconds per minute until sodium nitrite and sodium thiosulfate can be administered intravenously (see Note to Physician). A new amyl nitrite ampule should be used every 3 minutes. If conscious but symptoms (nausea, difficult breathing, dizziness, etc.) are evident, give oxygen. If consciousness is impaired (non-responsiveness, slurred speech, confusion, drowsiness) or the patient is unconscious but breathing, give oxygen and amyl nitrite by means of a respirator. If not breathing, give oxygen and amyl nitrite immediately by means of a positive pressure respirator (artificial respiration).

**Inhalation:**
If inhaled, remove to fresh air. Administer antidote kit and oxygen per pre-planned instructions if symptoms occur. Keep patient warm and at rest. Do not give mouth to mouth resuscitation.

**Ingestion:**
If ingested, antidote kit and oxygen should be administered per above. If the patient is conscious, immediately give the patient activated charcoal slurry. Never give anything by mouth to an unconscious person. Do not induce vomiting as it could interfere with resuscitator use.

**Skin Contact:**
Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean shoes before reuse. Administer antidote kit and oxygen per preplanned instructions if symptoms occur.

**Eye Contact:**
Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

**Note to Physician:**
If patient does not respond to amyl nitrite, inject intravenously with 10mL of a 3% solution of sodium nitrite at a rate of not more than 2.5 to 5 mL per minute.Once nitrite administration is complete, follow directly with 50 mL of a 25% solution of sodium thiosulfate at the same rate by the same route. Give victim oxygen and keep under observation. If exposure was severe, watch victim for 24-48 hours. If signs of cyanide poisoning persist or reappear, repeat nitrite and thiosulfate injections 1 hour later in 1/2 the original doses. Cyanocabalamin (B12), 1 mg intramuscularly, may speed recovery. Moderate cyanide exposures need be treated only by supportive measures such as bed rest and oxygen.

---

# 5. Fire Fighting Measures

**Fire:**
Not combustible, but upon decomposition or contact with acids, this material releases highly flammable and toxic hydrogen cyanide gas.

**Explosion:**
Not considered an explosion hazard, but upon heating with chlorates or nitrites to 450C

(842F) may cause an explosion. Violent explosion occurs if melted with nitrite salt. Sealed containers may rupture when heated.

**Fire Extinguishing Media:**

Use any means suitable for extinguishing surrounding fire. Do Not use carbon dioxide. Carbon dioxide can react with this material in the presence of moisture to produce hydrogen cyanide. Water spray may be used to keep fire exposed containers cool. Reacts slowly with water to form hydrogen cyanide.

**Special Information:**

In the event of a fire, wear full protective clothing and NIOSH-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode.

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## 6. Accidental Release Measures

Spills: Ventilate area of leak or spill. Allow only qualified personnel to handle spill. Clean-up personnel require protective clothing and respiratory protection from vapors. Collect material and place in a closed container for recovery or disposal. Do not flush to sewer! Decontaminate liquid or solid residues in spill area with sodium or calcium hypochlorite solution. US Regulations (CERCLA) require reporting spills and releases to soil, water and air in excess of reportable quantities. The toll free number for the US Coast Guard National Response Center is (800) 424-8802.

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## 7. Handling and Storage

Keep in a tightly closed container, stored in a cool, dry, ventilated area. Protect against physical damage. Separate from incompatibles. Workers must carefully follow good hygienic practices, including no eating, drinking, or smoking in workplace. Proper use and maintenance of protective equipment is essential. Workers using cyanide need preplacement and annual medical exams. Special training should be given to workers using cyanide. Containers of this material may be hazardous when empty since they retain product residues (dust, solids); observe all warnings and precautions listed for the product. Do not store near combustibles or flammables because subsequent fire fighting with water could lead to cyanide solution runoff. Do not store under sprinkler systems. All persons with the potential for cyanide poisoning should be trained to provide immediate First Aid using oxygen and amyl nitrite. A cyanide anitdote kit (amyl nitrite, sodium nitrite, and sodium thiosulfate) should be readily available in cyanide workplaces. The antidotes should be checked annually to ensure they are still within their shelf-lives. Identification of community hospital resources and emergency medical squads in order to equip and train them on handling cyanide emergencies is essential.

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## 8. Exposure Controls/Personal Protection

**Airborne Exposure Limits:**

-OSHA Permissible Exposure Limit (PEL):
5 mg/m3 skin (TWA) (as CN)
-ACGIH Threshold Limit Value (TLV):
5 mg/m3 (STEL) Ceiling, skin, as CN

**Ventilation System:**
A system of local and/or general exhaust is recommended to keep employee exposures below the Airborne Exposure Limits. Local exhaust ventilation is generally preferred because it can control the emissions of the contaminant at its source, preventing dispersion of it into the general work area. Please refer to the ACGIH document, *Industrial Ventilation, A Manual of Recommended Practices*, most recent edition, for details.

**Personal Respirators (NIOSH Approved):**
If the exposure limit is exceeded, wear a supplied air, full-facepiece respirator, airlined hood, or full-facepiece self-contained breathing apparatus. This substance has poor warning properties.

**Skin Protection:**
Wear impervious protective clothing, including boots, gloves, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

**Eye Protection:**
Use chemical safety goggles and/or full face shield where dusting or splashing of solutions is possible. Maintain eye wash fountain and quick-drench facilities in work area.

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# 9. Physical and Chemical Properties

**Appearance:**
White deliquescent granular solid.

**Odor:**
Almond odor. Bitter almonds.

**Solubility:**
48 g/100 cc @ 10C (50F)

**Specific Gravity:**
1.60 @ 25C/4C

**pH:**
Aqueous solutions are strongly alkaline.

**% Volatiles by volume @ 21C (70F):**
0

**Boiling Point:**
1496C (2725F)

**Melting Point:**
564C (1047F)

**Vapor Density (Air=1):**
No information found.

**Vapor Pressure (mm Hg):**
1 @ 817C (1503F)

**Evaporation Rate (BuAc=1):**
No information found.

---

# 10. Stability and Reactivity

**Stability:**
Very stable when dry. Moisture will cause slow decomposition, releasing poisonous hydrogen cyanide gas.
**Hazardous Decomposition Products:**
Emits toxic fumes of cyanide and oxides of nitrogen when heated to decomposition.
**Hazardous Polymerization:**
Will not occur.
**Incompatibilities:**
Acid. nitrates, nitrites, chlorates, fluorine, magnesium, and strong oxidizers. Reacts with acids to liberate toxic and flammable hydrogen cyanide gas. Water or weak alkaline solutions can produce dangerous amounts of hydrogen cyanide in confined areas. Reacts with carbon dioxide in air to form hydrogen cyanide gas.
**Conditions to Avoid:**
Heat, moisture, incompatibles.

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# 11. Toxicological Information

Oral rat LD50: 6440 ug/kg. Investigated as a tumorigen, mutagen, reproductive effector.

--------\Cancer Lists\----------

| Ingredient | ---NTP Carcinogen--- Known | Anticipated | IARC Category |
|---|---|---|---|
| Sodium Cyanide (143-33-9) | No | No | None |

---

# 12. Ecological Information

**Environmental Fate:**
No information found.
**Environmental Toxicity:**
This material is expected to be very toxic to aquatic life. This material is expected to be very toxic to terrestrial life.

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# 13. Disposal Considerations

Cyanides must be oxidized to harmless waste before disposal. An alkaline solution (pH about 10) is treated with chlorine or commercial bleach in excess to decompose cyanide. When cyanide-free, it can be neutralized. Whatever cannot be saved for recovery or recycling should be handled as hazardous waste and sent to a RCRA approved waste facility. Processing, use or contamination of this product may change the waste

management options. State and local disposal regulations may differ from federal disposal regulations. Dispose of container and unused contents in accordance with federal, state and local requirements.

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# 14. Transport Information

**Domestic (Land, D.O.T.)**

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**Proper Shipping Name:** RQ, SODIUM CYANIDE, SOLID
**Hazard Class:** 6.1
**UN/NA:** UN1689
Packing Group: I
**Information reported for product/size:** 12KG

**International (Water, I.M.O.)**

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**Proper Shipping Name:** SODIUM CYANIDE, SOLID
**Hazard Class:** 6.1
**UN/NA:** UN1689
Packing Group: I
**Information reported for product/size:** 12KG

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# 15. Regulatory Information

--------\Chemical Inventory Status - Part 1\---------------------------------

| Ingredient | TSCA | EC | Japan | Australia |
|---|---|---|---|---|
| Sodium Cyanide (143-33-9) | Yes | Yes | Yes | Yes |

--------\Chemical Inventory Status - Part 2\---------------------------------

| Ingredient | Korea | --Canada-- DSL | NDSL | Phil. |
|---|---|---|---|---|
| Sodium Cyanide (143-33-9) | Yes | Yes | No | Yes |

--------\Federal, State & International Regulations - Part 1\----------------

| Ingredient | -SARA 302- RQ | TPQ | ------SARA 313------ List | Chemical Catg. |
|---|---|---|---|---|
| Sodium Cyanide (143-33-9) | 10 | 100 | No | Cyanide comp |

--------\Federal, State & International Regulations - Part 2\----------------

| Ingredient | CERCLA | -RCRA- 261.33 | -TSCA- 8(d) |
|---|---|---|---|
| Sodium Cyanide (143-33-9) | 10 | P106 | No |

Chemical Weapons Convention: Yes TSCA 12(b): Yes CDTA: Yes
SARA 311/312: Acute: Yes Chronic: Yes Fire: No Pressure: No

Reactivity: No (Pure / Solid)

**Australian Hazchem Code:** 4X
**Poison Schedule:** S7
**WHMIS:**
This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

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# 16. Other Information

**NFPA Ratings:** Health: **3** Flammability: **0** Reactivity: **1**
**Label Hazard Warning:**
DANGER! MAY BE FATAL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN. CONTACT WITH ACIDS LIBERATES POISONOUS GAS. CAUSES BURNS TO SKIN, EYES, AND RESPIRATORY TRACT. AFFECTS BLOOD, CARDIOVASCULAR SYSTEM, CENTRAL NERVOUS SYSTEM AND THYROID.
**Label Precautions:**
Do not breathe dust.
Do not get in eyes, on skin, or on clothing.
Keep container closed.
Use only with adequate ventilation.
Wash thoroughly after handling.
**Label First Aid:**
IN ALL CASES, GET MEDICAL ATTENTION IMMEDIATELY. KEEP A CYANIDE ANTIDOTE KIT (amyl nitrite, sodium nitrite and sodium thiosulfate) in area of product use or storage. First-aiders must take precautions to avoid contact with cyanide substance. If ingested, administer antidote kit and oxygen per pre-planned instructions. If the patient is conscious, immediately give the patient activated charcoal slurry. Never give anything by mouth to an unconscious person. Do not induce vomiting as it could interfere with resuscitator use. If inhaled, remove to fresh air. Administer antidote kit and oxygen per pre-planned instructions if symptoms occur. Keep patient warm and at rest. Do not give mouth to mouth resuscitation. In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Administer antidote kit and oxygen per preplanned instructions if symptoms occur.
**Product Use:**
Laboratory Reagent.
**Revision Information:**
New 16 section MSDS format, all sections have been revised.
**Disclaimer:**
**********

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**Prepared by:** Strategic Services Division
Phone Number: (314) 539-1600 (U.S.A.)

# Safety data for dichloromethane


## General

Synonyms: methane dichloride, methylene chloride, methylene dichloride, aerothene MM, DCM, narkotil, solaesthin, solmethine, NCI-C50102, R 30, methylene bichloride, Freon 30
Molecular formula: $CH_2Cl_2$

CAS No: 75-09-2
EC No: 200-838-9

## Physical data

Appearance: colourless liquid
Melting point: -97 C
Boiling point: 40 C
Vapour density: 2.9
Vapour pressure: 6.8 psi at 20 C
Specific gravity: 1.32
Flash point: none
Explosion limits: 14 % - 22%
Autoignition temperature: 661 C
Water solubility: slight

## Stability

Stable. Incompatible with alkali metals, aluminium, strong oxidising agents, strong caustics, some forms of plastic, titanium.

## Toxicology

Harmful if swallowed or inhaled. May be harmful by skin contact. Eye and skin irritant. Readily absorbed through the skin. Asphyxiant. Causes CNS depression. **Possibly carcinogenic in humans. Possible mutagen. Experimental reproductive effects.**

**Toxicity data**
(The meaning of any abbreviations which appear in this section is given here.)

IHL-HMN TCLO 500 ppm/8h
SCU-DOG LDLO 2700 mg $kg^{-1}$
IHL-GPG LCLO 5000 ppm/2h
ORL-RAT LD50 1600 mg $kg^{-1}$
ORL-HMN LDLO 357 mg $kg^{-1}$
IPR-MUS LD50 437 mg $kg^{-1}$
IHL-MUS LC50 14400 mppm/7h.

**Risk phrases**
(The meaning of any risk phrases which appear in this section is given here.)
R40.

# Transport information

Packing group III. Hazard class 6.1. UN No 1593.

# Personal protection

Safety glasses and gloves. Good ventilation.

**Safety phrases**
(The meaning of any safety phrases which appear in this section is given here.)
S23 S24 S25 S36 S37.

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

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# Safety data for copper phosphate

## General

Synonyms: phosphoric acid copper salt
Molecular formula: Cu x[$H_3PO_4$]
CAS No: 10103-48-7
EC No:

## Physical data

Appearance:
Melting point:
Boiling point:
Vapour density:
Vapour pressure:
Density (g $cm^{-3}$):
Flash point:
Explosion limits:
Autoignition temperature:
Water solubility:

## Stability

## Toxicology

n/a

**Toxicity data**
(The meaning of any abbreviations which appear in this section is given here.)

**Risk phrases**
(The meaning of any risk phrases which appear in this section is given here.)

## Transport information

## Personal protection

Treat as potentially hazardous.

**Safety phrases**

(The meaning of any safety phrases which appear in this section is given here.)

[Return to Physical & Theoretical Chemistry Lab. Safety home page.]

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# Safety data for methylene diphenyl diisocyanate

## General

Synonyms: methylene bisphenyl isocyanate, MBI, MDI, 4,4'-diphenyl methane diisocyanate, diphenylmethyl diisocyanate, diphenylmethane diisocyanate, methylenedi-p-phenyl diisocyanate, NCI-C50668
Molecular formula: $C_{15}\,H_{10}\,N_2\,O_2$
CAS No: 101-68-8
EINECS No: 202-966-0

## Physical data

Appearance: white to light yellow flakes or crystals
Melting point: 37.2 C
Boiling point: 194 C at 5 mm Hg
Vapour density:
Vapour pressure:
Density (g $cm^{-3}$): 1.19
Flash point: 218 C
Explosion limits:
Autoignition temperature:

## Stability

Stable. Combustible. Incompatible with strong oxidizing agents. Reacts violently with alcohols.

## Toxicology

Toxic. Harmful by inhalation or ingestion. May be harmful through skin contact. Eye, skin and respiratory irritant. May cause allergic sensitization.

**Toxicity data**
(The meaning of any abbreviations which appear in this section is given here.)
ORL-RAT LD50 31690 mg $kg^{-1}$
IHL-RAT LC50 178 mg $m^{-3}$
IHL-HMN TCLO 130 ppm/30m

**Irritation data**
EYE-RBT 100 microg mild.

**Risk phrases**
(The meaning of any risk phrases which appear in this section is given here.)
R20 R36 R37 R38 R42.

# Transport information

# Personal protection

Safety glasses, adequate ventilation.

**Safety phrases**
(The meaning of any safety phrases which appear in this section is given here.)
S2 S26 S28 S38 S45.

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